

REMARKS/ARGUMENTS

Claims 1-10 and 12-20 stand rejected under 35 USC 112, first paragraph as failing to meet the written description requirement on the grounds that the claim limitation in claims 1 and 8 that the treatment device or mechanism presents “a substantially smooth surface” has no basis in the application as originally filed. The applicant has deleted this limitation from the claims (claims 1 and 8), thereby obviating this rejection. The applicant respectfully requests that this rejection be withdrawn.

Claim 19 stands rejected under section 35 USC 112, second paragraph as being indefinite due a lack of proper antecedent basis for the claim term “said sheet of glass” found in claim 19. It is submitted that proper antecedent basis for the claim term “said sheet of glass” in claim 19 can be found in paragraph c) of claim 1, from which claim 19 depends. Claim 1 as amended recites:

“c) using a device or mechanism (7, 8) for controlling glass travel speed to act on the treated stream (1a') at a suitable distance downstream to **produce a sheet of glass.**” [Emphasis added]

As such, the applicant respectfully requests that this rejection of claim 19 under section 35 USC 112, second paragraph be withdrawn.

Claims 1, 8, 9/1, 9/8, 12 and 13 stand rejected by the Examiner as being anticipated by Danner under 35 USC 102. The Applicant respectfully traverses this rejections as follows.

Claim 1 has been amended to include the limitations of presently cancelled claim 5, such that independent claim1 now claims:

“A method of producing sheets of glass having two faces (F₁, F₂) **with at least one of said faces (F₁) presenting a high surface quality**, the method comprising:

a) **delivering a stream of glass (1a) having a viscosity in the range of about 10 Pa.s to about 1000 Pa.s (100 poises to 10,000 poises).....;**

b) **treating said delivered stream of glass (1a) prior to destabilization by putting a first face (s₂) into contact with a surface of a treatment device or mechanism (4a) suitable, temporarily, to support the weight of said glass and for accompanying the falling movement of said glass while increasing glass viscosity and maintaining at least a central strip of said second face (s₁) free from any contact with any surface.**” [Emphasis added]

The present invention provides a method and device for the formation of glass sheets having at least one surface with a high surface quality using low viscosities in a fusion process. The advantage of the fusion process is that very thin, highly dimensionally stable glass sheets with a high degree of surface smoothness can be formed. This is because the glass is formed and hardens into sheets in the fusion process while it is falling substantially unsupported through the air. At least one surface of the glass can remain substantially free of contact with any surface or rollers until the glass has substantially

hardened, such that the surface will not be marred by contact with another surface and remains pristine and of high surface quality.

Prior to the present invention, the fusion process was limited to relatively high viscosity glasses having viscosities in the range of about 10 Pa.s to about 1000 Pa.s (100 poises to 10,000 poises). Without the present invention, lower viscosity glasses become mechanically unstable due force of gravity on the glass during the fusion process. As a result, only poor quality glass could be made from lower viscosity glasses. The present invention solves this problem by providing a treatment device that temporarily contacts one surface of the sheet of glass, in order to partially support the glass sheet and thereby prevent the mechanical instability that previously had prevented the formation of high surface quality glass sheets from low viscosity glass using the fusion process. The other face of the glass sheet remains substantially free of contact with any surface, so that at least one surface can maintain the high surface quality afforded by the fusion process.

Claim 1, as presently amended to more accurately reflect the advantages of the present invention, claims a process that delivers a stream of glass having a viscosity of about 10 Pa.s to about 1000 Pa.s (100 poises to 10,000 poises) to the treatment device. It is respectfully submitted that Danner as combined with Anderson, or any other prior art of record, fails to teach or suggest claim 1 as presently amended.

As indicated by the Examiner at the bottom of page 7 of the Final Action, it is well established that in the art of processing soda lime glass that the range of viscosity of soda-lime-silica glass in the working range is from 10,000 to 100,000,000 poise. The process as taught by Danner impresses a pattern into the glass with roll 10. Thus, the glass must be delivered to the roll 10 within the working range of the glass, i.e. when the viscosity of the glass is from 10,000 to 100,000,000 poise, in order to enable the glass to be impressed by the roll. Whereas, all of the pending claims of the instant application as presently amended claim the glass as being delivered to the treatment device with a viscosity from about 100 poises to 10,000 poises, which is outside the range taught by Danner.

Danner also fails to teach a process or device with which glass having at least one surface presenting a high surface quality can be made as claimed in claim 1 of the present application. First, the nozzle 17 taught by Danner must press hard enough on the glass to press the glass sheet against the roller with sufficient force to ensure that the figures on the roller 10 are impressed into the glass. An air nozzle at such a high pressure would have a deleterious effect on the surface of the glass facing the nozzle. Also, the second sheet of glass contacts surface 13 of the leer before the glass sheet is fully hardened. Danner states that this surface of the glass has been hardened by the nozzle to a degree that it will not be marred by the leer. It is submitted that the sliding the glass along the surface of the leer while it is still soft enough to bend in the leer as taught by Danner would mar or contaminate the surface of the glass to a degree that would be unsatisfactory compared the high quality surface obtained with the fusion process and would not meet the invention as presently claimed in claim 1.

In view of the preceding arguments it is submitted that claim 1 as presently amended is not anticipated by Danner and it is respectfully requested that that rejection of claims 1, 8, 9, 12 and 13 under 35 USC 102 as being anticipated by Danner be withdrawn.

The applicant respectfully disputes the Examiners position that Danner discloses a smooth surface on impression role 10. As previously pointed out by the Applicant, the

whole objective of the Danner reference is to impress (e.g. emboss) a design or pattern into the surface of the glass. The Examiner's attention is drawn to Danner reference at page 1 line 3 ("figured glass sheet"), page 1 lines 20-23 (The sheet... "while in a soft or formative stage has contact at one side thereof with the **figured surface of a roll or other impression member**"), page 1 lines 33-35 ("perfectly shape itself to conform to the roll configuration so that **such configuration is sharp and clearly defined on the sheet**"), page 1 lines 64-65 ("the softer side will easily **take the impression of the mold**"), page 2 line 50 ("impression roll 10"), page 2 lines 63-70 ("The roll 10 is provided on its periphery with **any configuration or impression** which it may **desire to impart to the side of the sheet** ... The sheet....to be pressed against and **take the impression of the roll**"), page 2 lines 100-103 ("to provide a surface of the sheet with **well cut, clearly defined figures**"), page 3 line 28 ("easily take the impression of the roll") [emphasis added].

The above cited portions of the Danner reference make it clear that the entire and only objective of the Danner invention is to impart a "figure" to one surface of the glass by impressing a figure on the surface of the roll into the surface of the glass. While it is true that at page 2 lines 63-70 Danner states that "any configuration or impression" may be employed, it is respectfully submitted that to say a smooth roll has a configuration or "figure" as intended by the Danner reference flies in the face of teachings of the Danner reference. It is nonsensical to say that a smooth surface can impress a figure into the glass.

It is submitted that one of ordinary skill in the art would understand Danner as teaching a method and device for impressing a textured pattern or figures into the glass, not to "impress" a smooth surface onto the glass. A smooth roll would have no figures to impress into the glass and cannot form well cut, clearly defined figures in the glass as taught by Danner. This understanding of the teachings of Danner is supported by Dictionary.com, which includes the following definitions for figure: (noun) a textural pattern, as in cloth or wood, or draperies with an embossed silk figure; (verb) to mark or adorn with a design or pattern.

Claim 5, the limitations of which are incorporated onto claim 1 as presently amended, stands rejected under 35 USC 103 as being obvious in view of Danner as combined with Anderson. The Applicant respectfully traverses this rejection as follows.

As discussed above, and as admitted by the Examiner, Danner fails teach or suggest the viscosity of the glass as it is delivered to the roll or treatment device. The Examiner rejected now cancelled claim 5, which has been incorporated into claim 1, on the grounds that Anderson teaches the delivery of a molten glass ribbon with a viscosity between about 1000 and 5000 poise (see page 13 of the Final Action).

Claim 1 as presently amended claims:

- "a **delivering a stream of glass** (1a) having a viscosity in the range of about 10 Pa.s to about 1000 Pa.s (100 poises to 10,000 poises), said stream of glass (1a) having a first and second face (s_1 , s_2), **each face is free from making contact with any surface and thus possibly being destabilized mechanically**;
- b) **treating said delivered stream of glass** (1a) prior to destabilization by putting a first face (s_2) into contact **with a surface of a treatment device or mechanism**

(4a) **suitable, temporarily, to support the weight** of said glass and for accompanying the falling movement of said glass while increasing glass viscosity and maintaining at least a central strip of said second face (s₁) free from any contact with any surface;

c) using a device or mechanism (7, 8) for **controlling glass travel speed to act on the treated stream (1a') at a suitable distance downstream** to produce a sheet of glass; and

d) cooling said sheet of glass.” [Emphasis added]

The applicant submits combination of Danner with Anderson is improper and would not result in the invention as claimed for the following reasons.

Claim 1 as amended, claims that each face of the stream of glass is free from making contact with any surface and thus possibly being destabilized mechanically prior to delivery to the treatment device. If the mold 32 in Anderson is to be considered the treatment device, then the method and device taught by Anderson contacts both surfaces of the glass with rollers 24A and 24B prior to delivery of the glass to the mold.

Claim 1 as presently amended also claims “treating said delivered stream of glass (1a) prior to destabilization by **putting a first face (s₂) into contact with a surface of a treatment device or mechanism (4a) suitable, temporarily, to support the weight and for accompanying the falling movement of said glass,**” and “using a device or mechanism (7, 8) for controlling glass travel speed to **act on the treated stream (1a') at a suitable distance downstream to produce a sheet of glass of said glass.**” Thus, claim 1 as currently amended clearly only temporarily supports the glass with the treatment device and moves with the glass while the viscosity is raised. The glass sheet then separates from the treatment device and falls (travels) downstream from the treatment device where it acted on to produce a sheet of glass. In the Anderson method and apparatus, the sheet of glass is laid down on a mold 32. The sheet of glass then sits stationary on the mold and hardens into a glass article.

The operation of the impression roll taught by Danner and the mold 32 taught by Anderson are completely different. The impressing roll taught by Danner temporarily contacts the glass sheet to impress a pattern into the glass as the glass sheet continuously moves on past the roll into the leer in a continuous glass formation process. Whereas the mold 32 taught by Anderson receives the glass and holds the glass stationary therein/on as the glass hardens into the final multi-layer glass article in a discontinuous glass formation process. The stationary mold 32 in Anderson is by no means comparable or interchangeable with the rotating impressing roll 10 taught by Danner, and in no way suggests to one of ordinary skill in the art what viscosities would be suitable for delivery of the glass to the impressing roll taught by Danner.

It is submitted that one of ordinary skill in the art would not have looked to the vastly different Anderson process (stationary, discontinuous molding) and end product (multi-layer glass article), in order to improve on the Danner process (continuous, moving glass formation) and end product (patterned single sheet of glass). Even if one of ordinary skill in the art were to look to the Anderson reference, it is submitted that given the differences in operation and construction of the two devices, any combination of these two

references would not result in the claimed invention without the impermissible use of hindsight after having viewed the invention of the instant application.

In view of the above and other reasons not discussed herein, the Applicant submits that the combination of Anderson with Danner is improper, and if so combined by one of ordinary skill in the art would not have resulted in the presently claimed invention without the impermissible use of hindsight, and respectfully requests that the rejection of the claims as being obvious under 35 USC 103 in view of Danner as combined with Anderson be withdrawn.

The various other references applied by the Examiner to reject the dependent claims fail to cure the deficiencies of the Danner and Anderson references when applied to claim 1 (and other claims) as presently amended. Therefore, it is requested that the rejections of the dependent claims be withdrawn. Since claim 1 is the only independent claim, it respectfully submitted that all of the claims remaining in this application, namely claim 1-3, 6-10 and 12 - 20 as presently amended, are hereby placed into condition for allowance.


Based upon the above amendments, remarks, and papers of records, applicant believes the pending claims of the above-captioned application are in allowable form and patentable over the prior art of record. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Applicant believes that no extension of time is necessary to make this Reply timely. Should applicant be in error, applicant respectfully requests that the Office grant such time extension pursuant to 37 C.F.R. § 1.136(a) as necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to the deposit account of the undersigned firm of attorneys, Deposit Account 03-3325.

Please direct any questions or comments to Bruce P Watson at 607-974-3378.

Respectfully submitted,

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